

**WHAT IS CLAIMED IS:**

1. A surgical instrument for performing an anastomosis, comprising:
  - a housing having proximal and distal ends;
  - a shaft extending from the distal end of the housing;
  - an actuator attached to the housing;
  - a disposable loading unit configured for selective attachment to the shaft, the disposable loading unit including:
    - a fastener support member configured and dimensioned to support an array of surgical fasteners; and
    - a fastener pusher member which is movable through a firing stroke in response to movement of the actuator to deform the surgical fasteners.
2. A surgical instrument for performing an anastomosis according to claim 1 wherein the disposable loading unit includes opposed split sections which are pivotable relative to one another.
3. A surgical instrument for performing an anastomosis according to claim 2 wherein the opposed split sections are pivotable between an open position and a close position after movement of the fastener pusher member through the firing stroke.
4. A surgical instrument for performing an anastomosis according to claim 2 wherein the opposed split sections of the disposable loading unit are locked in a closed,

non-pivotable configuration prior to initiation of the firing stroke.

5. A surgical instrument for performing an anastomosis according to claim 4 wherein after the firing stroke, the return of the fastener pusher member unlocks the opposable split sections to allow pivotable movement thereof.

6. A surgical instrument for performing an anastomosis according to claim 1 wherein the fastener support member supports the surgical fasteners in a partially compressed configuration.

7. A surgical instrument for performing an anastomosis according to claim 6 wherein the surgical fasteners are generally C-shaped.

8. A surgical instrument for performing an anastomosis according to claim 1 wherein each of the surgical fasteners includes a proximal tip and a distal tip and wherein at least one of the proximal and distal tips of at least one of the surgical fasteners is atraumatic.

9. A method of performing a vascular anastomosis between first and second vessels comprising the steps of:

- providing a surgical instrument which includes:

a housing having proximal and distal ends with a shaft extending from the distal end of the housing;

an actuator attached to the housing;

a disposable loading unit configured for selective attachment to the shaft, the disposable loading unit having a passageway defined therethrough and including:

a fastener support member configured and dimensioned to support an array of surgical fasteners at a distal end thereof, the surgical fasteners having proximal and distal tips; and

a fastener pusher member which is movable through a firing stroke in response to movement of the actuator to deform the surgical fasteners;

- inserting the first vessel through the passageway and everting an end of the first vessel over the distal end of the fastener support member adjacent the distal tips of the surgical fasteners;
- inserting the fastener support member and the everted end of the first vessel into an opening in a sidewall of the second vessel such that the proximal tips of the surgical fasteners are adjacent the opening;

connecting the disposable loading unit to the shaft; and

- actuating the actuator to deform the surgical fasteners to secure the first and second vessels in fluid communication with one another.